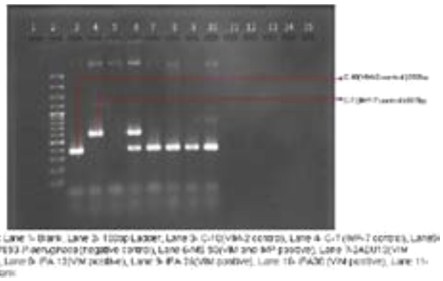
with IMP, positives (inhibition ≥7 mm) confirmed by IMP + EDTA Etest and PCR (VIM and IMP genes).

Results: Of the 75 PSA isolates, 12(16%) were MBL producers. Diabetes mellitus was found to be the major risk factor in PSA infections. Overall resistance to CIP 50.7%> CZD 37.3% >AK 36%> FEP 34.7%. Resistance pattern among MBL/NMBL was CZD(91.7%/23.8%), FEP(91.7%/20.6%), TZP(91.7%/15.9%), TIM(100%/27%), GEN(100%/23.8), AK(100%/20.6%), CIP(100%/38.1%), IMP(100%/6.3%), MEM(75%/9.5%), ATM(91.7%/38.1%). Resistance to IMP and MEM was 22.7% and 21.3% respectively. All isolates were susceptible to CL. MDR (resistant to ≥2 classes of antimicrobials) was 34(45.3%).Overall 14(18.7%) were CDDT positive. IMP + EDTA Etest and PCR confirmed 12 to be MBL positives. Among the MBL isolates, one was also positive for IMP gene, which on sequencing was confirmed to be IMP 7. Sensitivity and specificity of CDDT was 100% and 96.8% respectively when compared to PCR. History of prior antibiotic usage of aminoglycosides (66.7%), 3rd generation cephalosporins (58.3%), quinolones (58.3%), carbapenems (50%), penicillins (25%), betalactam + betalactamase inhibitors (8.3%) was noted for the patients with MBL infection. Clinical improvement or cure with modification of initial antibiotics was found in 63.6% (7/11) patients with MBL PSA.



PCR for VIM and IMP gene in PSA

Conclusion: MBL production is an important mechanism of CARB-R among PSA. Spread should be further minimized by using carbapenems judiciously in the treatment of PSA infections. CDDT is a useful method for screening MBL. VIM type of MBL was seen among all MBL positive isolates.

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23.002

The resistance patterns of *Pseudomonas aeruginosa* in hospitals from Greece and Romania and its importance for the therapy of nosocomial infections and infection control practices

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Background: One of the most difficult problems in hospitals is the appearance of an increased number of Pseudomonas antibiotic resistant strains. The objective of our study is to describe the resistance pattern of *Pseudomonas aeruginosa* strains.

Methods: For isolating *Pseudomonas aeruginosa* strains, the usual nutritive media were used. Identification was made with Vitek2 system (BioMerieux). The susceptibility to the antibiotics of strains was performed by Kirby Bauer method as recommended by CLSI and Vitek2 system. Were tested 229 strains isolated from urine and surgical wounds, in Cluj Napoca, Romania, and 36 strains isolated from blood samples in Chania, Greece. The majority of the strains (86.1%) were isolated from patients in wards and a percentage of 13.8 from Intensive Care Unit.

Results: The strains isolated in Romania from urine showed a high resistance to betalactamins, remaining susceptible to Carbenicillin, Carbapenems, Ceftazidime and Cefepime. Over 80% of the strains, were resistant to others of third generation cephalosporins. The strains isolated from blood, presented resistance to Aztreonam (30.43%) and Ceftazidime (13%). 13% were resistant to Imipenem and Meropenem. Pseudomonas *aeruginosa* isolated strains in Romania, showed resistance to Amikacin (71.4% isolated strains from urine and 29.7% from surgical wounds), and a low resistance to Gentamycin (18.6%), Tobramycin (25%). 29.6% were resistant to Colistin. The strains isolated in Chania, showed resistance to Gentamycin (21.4%). All strains isolated from urine, were resistant to Pefloxacin and a high resistance was detected to Nalidixic acid (75%), Ciprofloxacin (75%) and Ofloxacin (50%). The strains isolated from surgical wounds, presented a resistance to quinolones, oscillating between 33.1% and 51.9%. The isolated strains from blood showed resistance to Nalidixic acid (38.5%), Pefloxacin (38.5%) and Ciprofloxacin (38.5).

Conclusion: Our results could reflect the implication of some hospital multi resistant *Pseudomonas aeruginosa* strains in nosocomial infections. In Greece, a decline in drugs resistance of Pseudomonas strains has been noted. As a fact, it is rather encouraging, and probably we can attribute it to adherence to infection control practices and prudent chemotherapeutic agents use as proposed by Infectious Diseases Control Committee. The majority of the strains was detected in ward patients and owing to reduced morbidity

factors compared with patients in ICU, the reduced resistance to antibiotics can be explained.

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23.003

Extended spectrum β-lactamase production at the Komfo Anokye Teaching Hospital, Kumasi, Ghana

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Background: In recent times enterobacteriaceae isolated at the Komfo Anokye TeachingHospital (KATH) have shown significant resistance to 2nd and 3rd generation cephalosporins. In 2006, 18-32% of all enterobacteriaceae isolated from urine and blood were resistant to the cephalosporins cefuroxime, ceftriaxone, ceftazidime and cefotaxime. These antibiotics are the mainstay for the treatment of severe infections in the hospital. Microbial resistance to these antibiotics if due to the production of Extended spectrum β-lactamases (ESBL) may also indicate resistance to the fluoroquinolones, aminoglycosides and other antibiotics. This limits therapeutic options for the treatment of severe infections. We studied the extent of ESBL production amongst *Klebsiella sp* and *E. Coli* at KATH.

Methods: ESBL production in 300 non-selected, non-duplicate isolates of *Klebesiella sp* and *E.coli* obtained from blood, urine, wounds, and sputum of both in-patients and out-patients was determined by the combined disc method using ceftazidime, ceftriaxone and cefpodoxime discs singly and in combination with clavulanic acid.

Results: 44% and 55% respectively of *E.coli* and *Klebsiella sp* (57.8% K.pneumo,) were ESBL producers. ESBL production in the organisms was commoner in in-patients (75.4%) than out-patients (24.6%), though not statistically significant (OR=1.40, 95% CI 0.79-2.46, p=0.31). In general, ESBL producing organisms apart from being resistant to cephalosporins were also resistant to gentamicin and ciprofloxacin. They were however susceptible to the carbapenems.

Conclusion: The high level of ESBL production found in these enterobacteriaceae with the resultant microbial resistance to available cephalosporins and other agents implies difficulties with the choice of therapeutic options for the treatment of severe infections. Carbapenems are expensive on the Ghanaian market and their use in non-severe infections (as may be suggested by these results) may be inappropriate. Both prescribers and pharmaceutical agents will need to reflect soberly on their contribution to this sordid state of affairs. We need to put an end to our practice of cracking nuts with sledge hammers!

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23.004

Antimicrobial susceptibility profile of *Pseudomonas aeruginosa* strains isolated at a tertiarycare University Hospital (S. Orsola Hospital, Bologna, Italy)

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Background: The increased rate of antimicrobial resistance among Gram-negative bacilli and Enterobacteriaceae is a general concern,especially in the hospital setting.A prospective microbiological monitoring including a continued surveillance of antimicrobial susceptibility rates of all relevant pathogens,is ongoing at our Hospital.

Methods: The temporal variations of *in vitro* antimicrobial sensitivity rates were registered at quarterly intervals for all suitable *Pseudomonas aeruginosa* strains,during the year 2008.The same pathogen cultured more than once from the same patient within one month,has been considered once.

Results: Among *Pseudomonas aeruginosa* isolates (494 strains tested on the whole), the best performance was obtained by the old colistin (colimycin),with a 100% susceptibility rate, followed by piperacillin-tazobactam (73.9-78.6.4% of tested strains),amikacin (71.7-84.5% of tested strains),imipenem (69.9-79.1% of tested strains),ceftazidime (from 68.0 to 82.5% of tested strains),tobramycin (from 63.0 to 76.4% of tested strains).On the other hand,significantly less effective sensitivity profiles were shown by gentamicin (57.5% to 71.3% of tested strains),ciprofloxacin (51.3-68.0% of tested strains),aztreonam (59.5-61.2% of tested strains),ticarcillin-clavulanate (54.2-66.9%),and mezlocillin (45.3-54.2% of tested strains).When examining temporal trends of antibiotic sensitivity figures in the examinewd period (January-December 2008), significantly favorable changes were observed only for ceftazidime and ciprofloxacin ($p < .025$).

Conclusion: A prospective surveillance study of antimicrobial susceptibility rates of a major hospital-associated organism like *Pseudomonas aeruginosa* is of remarkable importance, to establish reliable guidelines of antibiotic treatment and prophylaxis, on local-regional basis. Piperacillin-tazobactam, amikacin,imipenem,and the same ceftazidime still maintain a reliable role in eventual,empiric regimens to be added pending microbial isolation and in vitro susceptibility studies,since they remained active in nearly 80% of hospital isolates of the last year 2008.Colistin maintained full *in vitro* activity against all *Pseudomonas* strains observed over time. An appreciable increase of sensitivity rates to ceftazidime and ciprofloxacin was also observed over the last year 2008.

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